

day, 21/08/2008 5:15:23 PM

ecocq

Process Sheet

: CU-DAR001 Dart Helicopters Services
 : 41580
 Estimate Number : 12485
 P.O. Number :
 This Issue : 21/08/2008 S.O. No. :
 Prsht Rev. : NC
 First Issue : / / Type : CROSSTUBES
 Previous Run : 38493
 Written By :
 Checked & Approved By : JUD 08.8.22
 Comment :
 : Est Rev:A New Issue 06-07-05 JLM
 : Est Rev:B Update qty of MS21042L5 06-09-12 KJ
 : Est Rev:C Rev B 07-11-15 DD
 : Est Rev:D Combined manufacturing 08.04.02 EC verified by:
 : DD
 : Est Rev:E 08-06-24 revD as per dwg DD verified by:EC
 Drawing Name : 350/355 AS X-TUBE FWD
 Part Number : D350748101 ✓
 Drawing Number : N/A
 Project Number : N/A
 Drawing Revision : D
 Material :
 Due Date : 10/09/2008 Qty: 1 Um: Each

Additional Product

Job Number:



Seq. #:

Machine Or Operation:

Description :

1.0

DC

DOCUMENT CONTROL



JUD 08.8.28



Comment: Photocopy bluefile & type labels per PPPD350-748-101 CHG001

508/12/18

2.0

D350748141TRN

Crosstube Turning Detail



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch: *B-42403*

D/MB 08-11-17

3.0

BENDING

BENDING MACHINE - SKIDTUBES



Comment: BENDING MACHINE

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT

D/MB 08-11-20

4.0

QC15

DIMENSIONAL CHECK OF X-TUBES



Comment: DIMENSIONAL CHECK OF X-TUBES

08-11-20 6

5.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs,
Set-up drill table as per QSI 010

2-Deburr

08-11-20

P-70

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D350-748-101 PAR #: NA Fault Category: Prod/x-tube NCR: Yes No DQA: D Date: 08/12/19
 Resolution: _____ Disposition: _____ QA: N/C Closed: D Date: 08/12/19

NCR: 41580		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
06-11-20	5.0	Cuff 'A' is higher than 'B' by 0.3125, and side 'B' is low.	<i>[Signature]</i> 08/14/21	Cut cuff 'A' to match the height of cuff 'B'. - deburr - drill both cuffs to 0.600" to make the tube nominal height	<i>[Signature]</i> 08-11-20	S 08/14/21	<i>[Signature]</i> 08/14/21	<i>[Signature]</i> 06-11-20

NOTE: Date & initial all entries

Date: Thursday, 21/08/2008 5:15:23 PM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD

Job Number: 41580

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

3-Engrave Part # and Batch # as per Dwg D350-748-141

RT 08-11-20

4-Remove all marks from tube within limits of D350-748-141

Jb 8-11-20

5- Apply a light coat of LPS3 on the interior of tube

Batch: M109539

RT 08-11-21

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

CHECK 10 DEG HOLES WITH DT8876E(EUROCOPTER CLAMP)

Sos 11/21

7.0

OUTSIDE SERV.10

OUTSIDE SERVICES -skids



Comment: Sub-Contracting OUTSIDE SERVICES

Issue P/O: 7642

Stress relief at 375° for 5 hours

Magnetic Particle Inspect per ASTM E1444

Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2

Embrittle relief at 375° for 8 hours, Chromate Treat

Possible Supplier: Southwest United Industries

Ensure Certificate of Conformity is attached

CD 08/11/25 (1)

8.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Receive & Inspect For Transit Damage

Ensure certificate of conformity is attached

P 8/14/08 (1)

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

081212 (1)

10.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside crosstube as per QSI 005 4.2

2-Prime Outside of Tube as per Dart QSI 005 4.2

7 ml 08 12 16 (1)
wink
~~DO NOT PAINT~~
~~ASSEMBLE PRIMER ONLY~~

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Thursday, 21/08/2008 5:15:23 PM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD

Job Number: 41580

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

18.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install Ground wire Insert, then insert screw and washer

2-Install Abraision strips as per Dwg D350-748-141 & QSI 035.

3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS

25
08-12-17

19.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 08/12/17 (X)

20.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

21.0

D35001

Saddle



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

350 SADDLE

Batch: B36016

8/12/17

SP

22.0

D35011

Bushing



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

BUSHING

Batch: B39726

8/12/17

SP

23.0

AN46A

Bolt



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)

Bolt

Batch: M109559

8/12/17

SP

24.0

AN441A

bolt



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

bolt

Batch: M109068

8/12/17

(X)
SP

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng				Sign & Date

NOTE: Date & initial all entries

Date: Thursday, 21/08/2008 5:15:24 PM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD

Job Number: 41580

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

25.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Bolt

Batch: M109752

8/12/17

SP

26.0

AN960JD416

Washer



Comment: Qty.: 32.0000 Each(s)/Unit Total : 32.0000 Each(s)

Washer

Batch: M109249

8/12/17

SP

27.0

AN960JD516

Washer



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Washer

Batch: M109752

8/12/17

SP

28.0

MS21042L4

Nut



Comment: Qty.: 24.0000 Each(s)/Unit Total : 24.0000 Each(s)

Nut

Batch: M108145

8/12/17

SP

29.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Nut

Batch: M109297

8/12/17

(X)

SP

30.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

8 08/12/17

(X)

31.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D350-748-101

Location:

PPP Rev:

B

8/12/17

(X)

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B		Sign & Date	Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng				

NOTE: Date & initial all entries

Date: Thursday, 21/08/2008 5:15:24 PM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 350/355 AS X-TUBE FWD

Job Number: 41580

Part Number: D350748101

Job Number:



Seq. #:

Machine Or Operation:

Description :

32.0

QC21

FINAL INSPECTION/W/O RELEASE



08/12/18 *HL*

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



W.O. 12.18

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE		By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

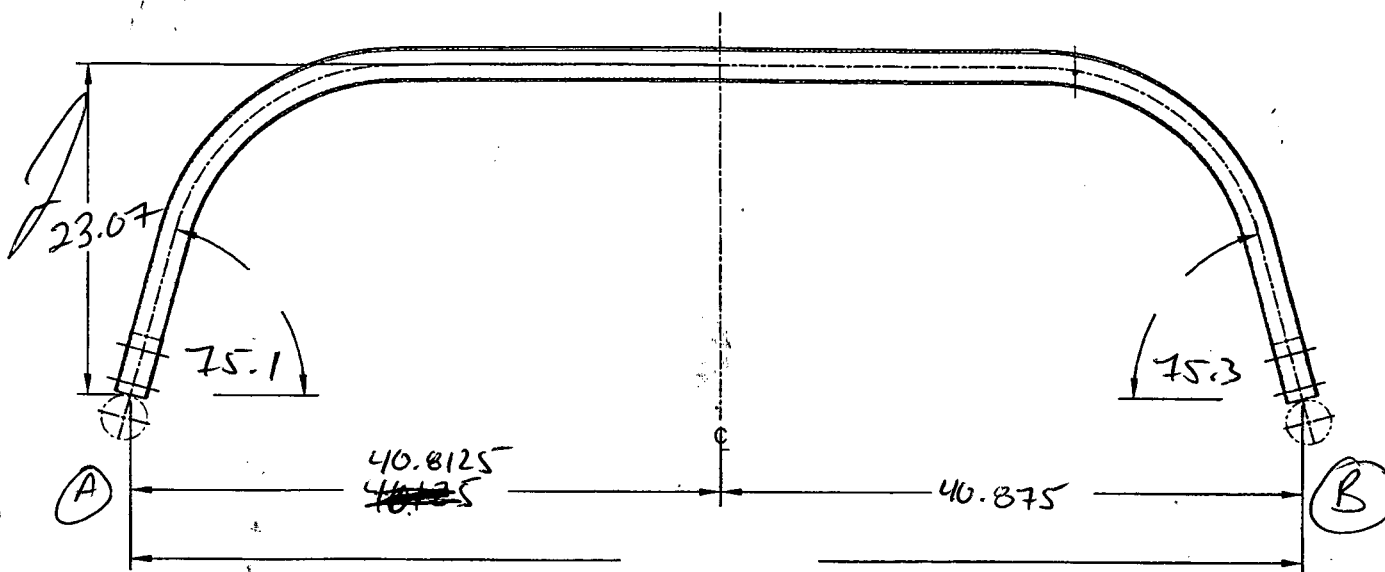
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order: 41580
Description: Crosstube High Fwd (AS350/355)		Part Number: D350-748-101
Inspection Dwg: D350-748-141	Rev: D	Page 1 of 1

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
Cuff A was higher than B by 0.3125.
Cut cuff A same as B @ 23.07 and drill cuffs @ .600 up.

QC15 Inspection	051411
Date	08-11-20

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	

DART

DESIGN <i>QP</i>	DRAWN BY <i>QP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>HA</i>	APPROVED <i>HA</i>	DRAWING NO. D350-748-141	REV. D SHEET 1 OF 3
DATE 06.10.31		TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE NTS
A	06.03.31	NEW ISSUE	
B	06.06.30	ADD D6017-115 & PRIME AND PAINT	
C	06.08.14	ADD CAD PLATING	
D	06.10.31	MAG. PARTICLE AND CAD PLATE AS MFD.	

RELEASED*06.10.31 HA*

QTY	P/N	DESCRIPTION
X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
1	D6017-115	CROSSTUBE (OR D6015-125)
2	D3502-1	SUPPORT
2	D2856-400-710	ABRASION STRIP
1	AELS-1032-225	INSERT
1	AN960JD10	WASHER
2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
1	MS27039-1-10	SCREW

D350-748-141 CROSSTUBE:

- 1) MATERIAL: MANUFACTURED FROM D6017-115 OR D6015-125
FINISHED LENGTH = 110.27±0.06
- 2) MACHINE PER MACHINING DETAIL ON PAGE 3. BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITIONS SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 3) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 4) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 5) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING
- 6) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 7) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 8) INSTALL D2856-400-710 ABRASION STRIP WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 9) TORQUE MS21920-20 CLAMPS 60 TO 80 IN-LB
- 10) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 11) ALL DIMENSIONS ARE IN INCHES
- 12) PART IS SYMMETRIC ABOUT CENTERLINE EXCEPT FOR Ø0.297 HOLE.

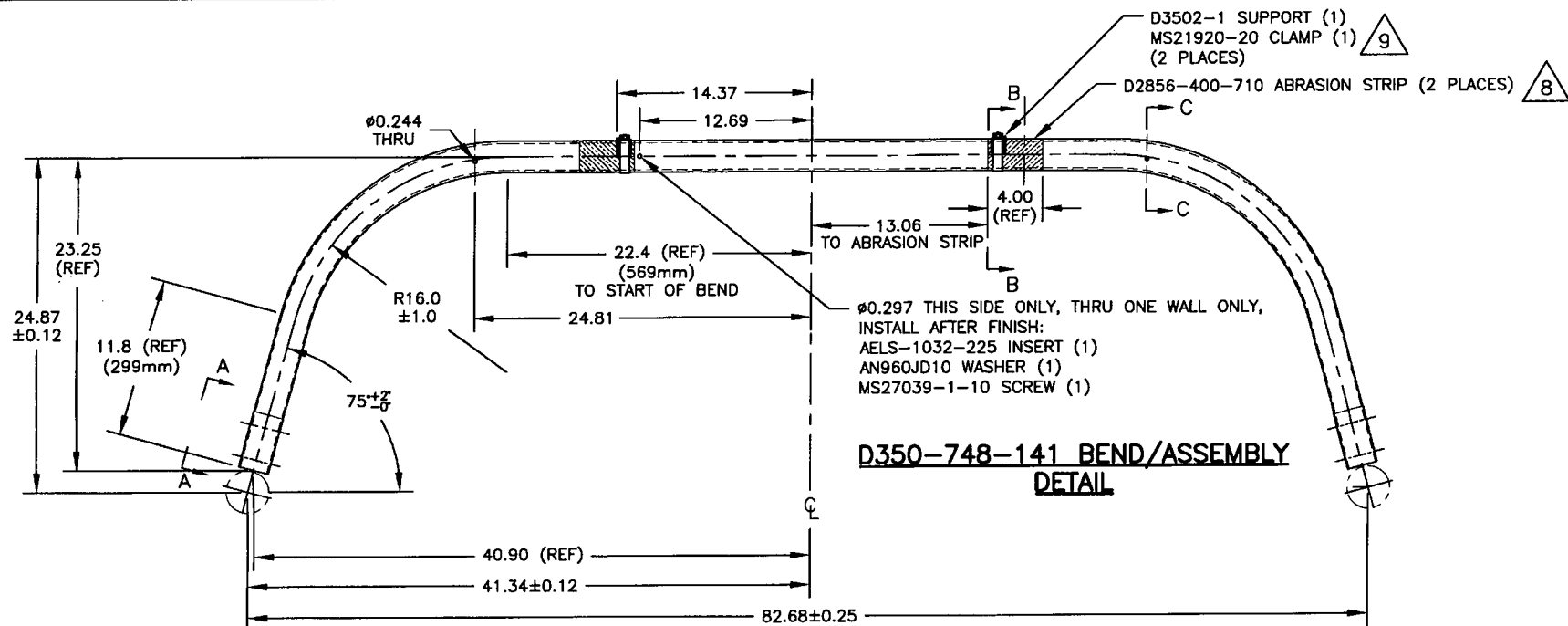
UNDER REVIEW07.02/16 *HA*

CUT FOR REVIEW

07.02.22

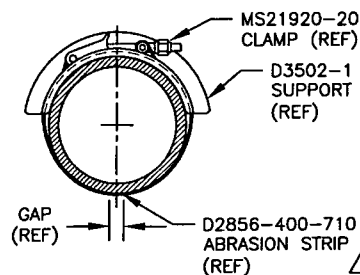
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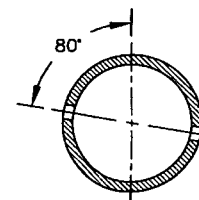
SECTION B-B

SCALE 1:2



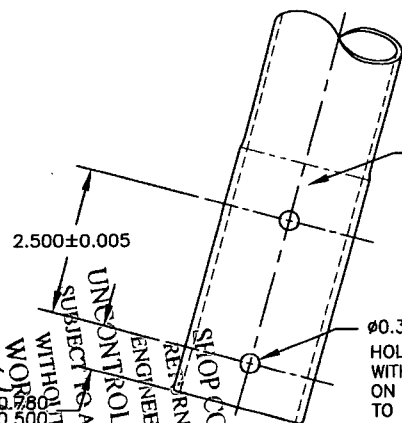
SECTION C-C

SCALE 1:2



VIEW A-A

SCALE 1:2



Ø0.323 ±0.003 (THRU, TYP)
HOLE TO BE ALIGNED
WITHIN ±0.001 OF HOLE
ON OTHER SIDE OF CUFF,
TO BE DRILLED AFTER BENDING

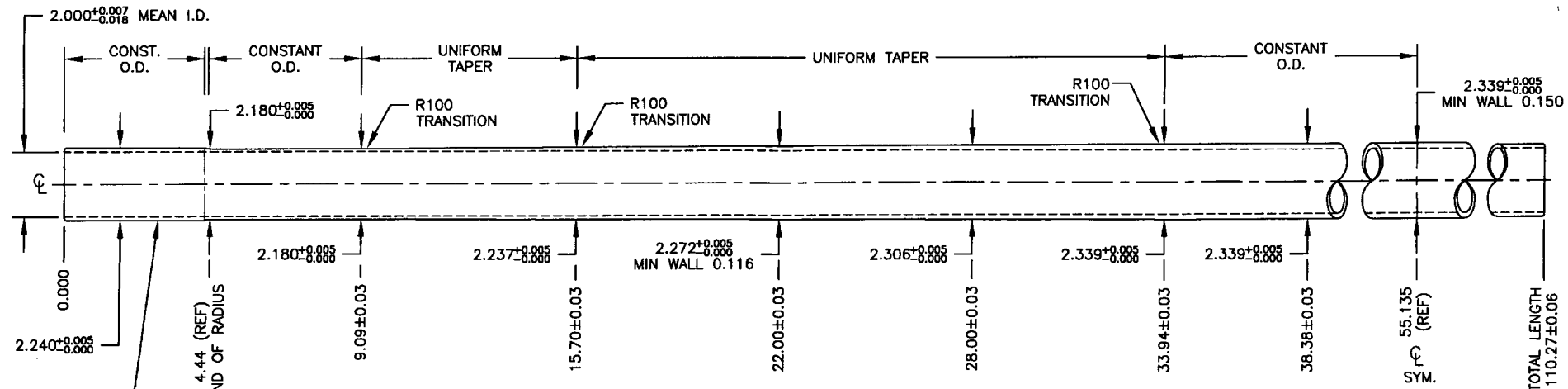
UNDER REVIEW
07.02.16.17
CUFF FROM REVISION
06.10.22
RELEASED
06.10.31

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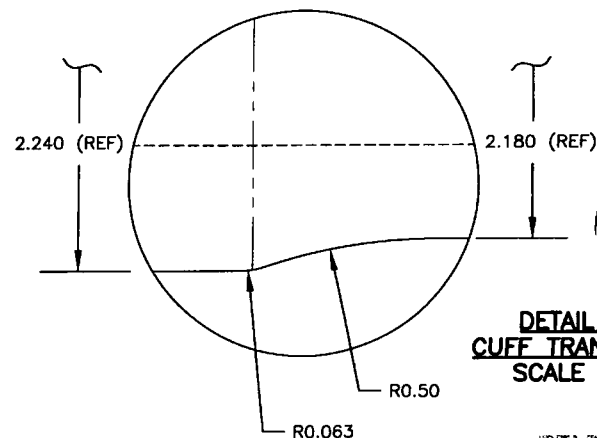
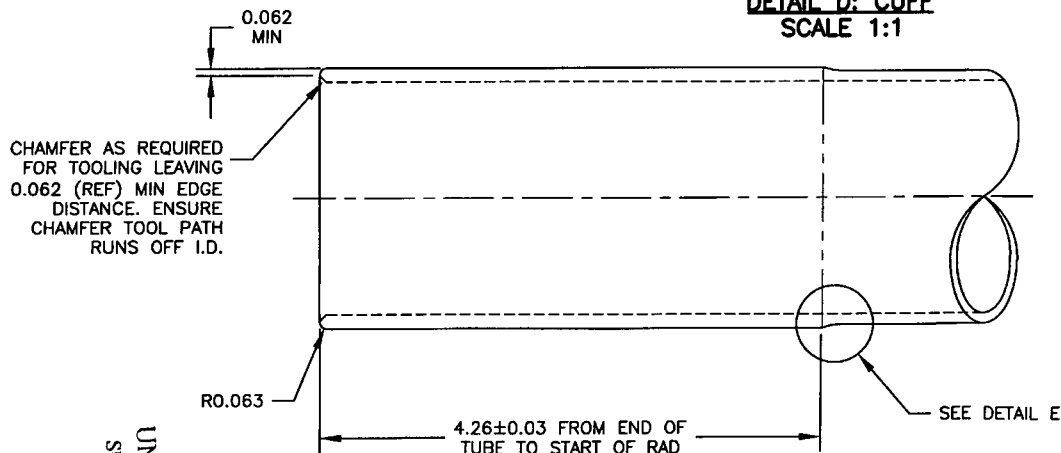
DESIGN	40	DRAWN BY	40	DART	DART AEROSPACE LTD. HAMBLETON, ONTARIO, CANADA
CHECKED	#	APPROVED	#	DRAWING NO.	D350-748-141
DATE	06.10.31	TITLE	CROSSTUBE (AS 350/355 HI FWD)	SCALE	1:8

NO. 41580
UNCONTROLLED COPY
ENGINEERING
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORKS
06.10.31



D350-748-141 MACHINING DETAIL

**DETAIL D: CUFF
SCALE 1:1**



**DETAIL E:
CUFF TRANSITION
SCALE 9:1**

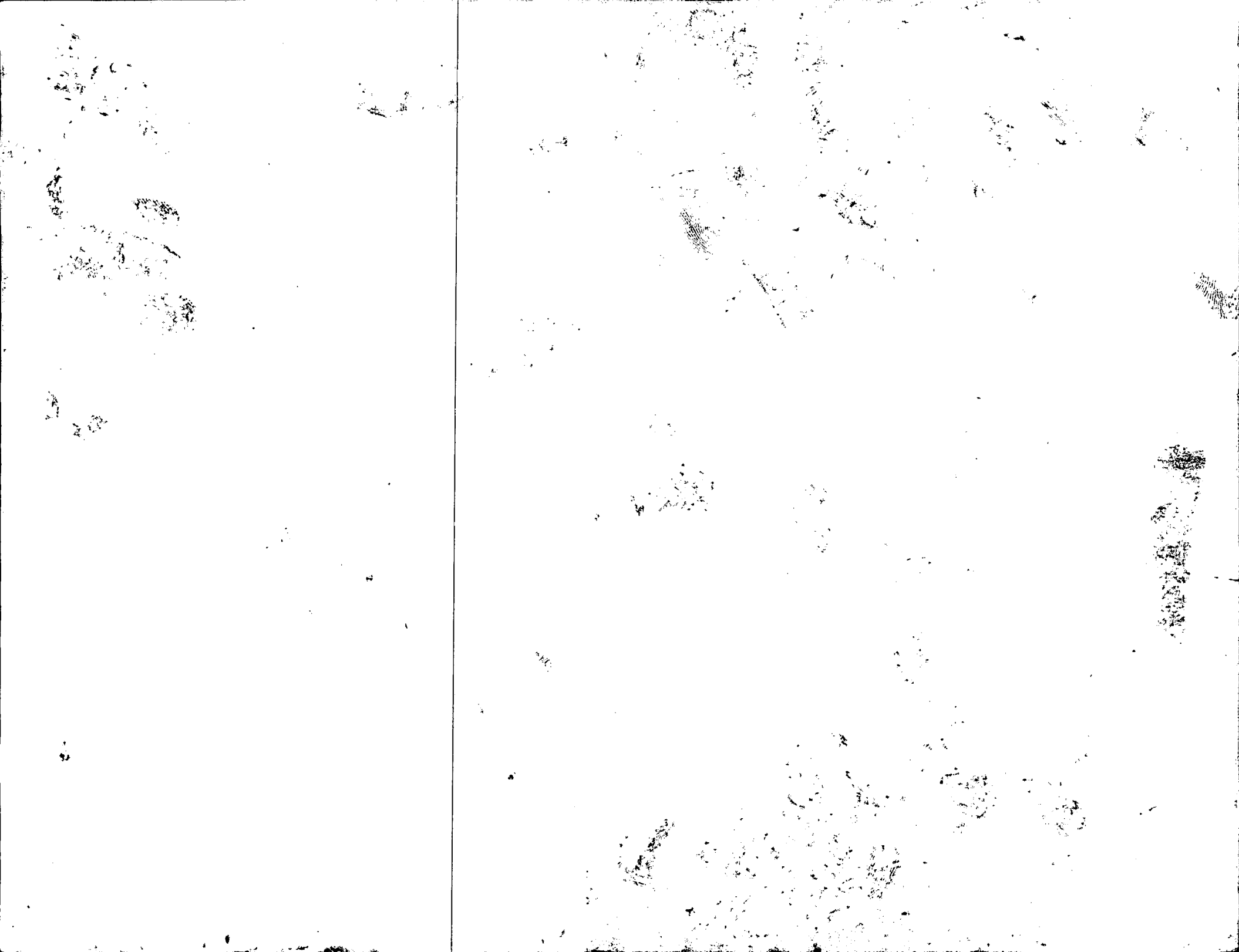
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06.10.31

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DESIGN qp	DRAWN BY qp	DART	DART AEROSPACE LTD. HAMPSHIRE, ENGLAND, CANADA
CHECKED #	APPROVED #	DRAWING NO. D350-748-141	REV. 0 SHEET 3 OF 3
DATE 06.10.31	TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE 1:3	

NO. 41580
WORK ORDER
SUBJECT TO AMENDMENT
UNCONTROLLED COPY
ENGINEERING
RETURN TO
SHOP COPY



Packing Slip



Cadorath Plating Co. Ltd.

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2

Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:

42163

Sold To:

Dart Aerospace Ltd.
1270 Aberdeen St.

Hawksbury, ON K6A 1K7

ShipTo:

Net 2% Interest Per Month charged on Overdue Accounts.

Any claims for shortages, overcharges, or damaged goods must be made within seven (7) days from receipt of goods.

Customer Order #:	Date Received:	Terms:	G.S.T. #:	Ship Via:	Ship Date:
7642	Nov-25-2008	NET 30 DAYS	10071 6547 RT0001		Dec-04-2008

Item # Qty P/N & Description

1 1 EA ~~SKD~~ *x-tube* S/N B41580
P/N d350-748-101 ✓ W/O 82023

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Dec-04-2008

CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 82023
INVOICE #: 42163

**CONTRACT OR
PURCHASE ORDER #** 7642 ✓

DESCRIPTION: S KID

QTY 1

P/N # d350-748-101 ✓

S/N # B41580 ✓

**STRESS RELIEF BAKE @ 375 FOR 5 HRS HEAT CHART # 9878. MPI
INSPECTED IAW ASTM E 1444. CADMIUM PLATED IAW AMS-QQ-P-
416B, TYPE 2 YELLOW, CLASS 1 . HEAT CHART # 9911.**

**CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.**

Approved Inspector:



A large, stylized handwritten signature in black ink.